



Valves, Automation & Controls



# 40 SERIES

**INSTALLATION, OPERATION, AND MAINTENANCE MANUAL**

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# Installation, Operation, and Maintenance Manual

## Series 40

### Wafer & Lug Style Ball Valves Sizes 2”-4” Class 150

#### **GENERAL**

The following instructions only refer to Sharpe® standard valves as described in the current catalog. Keep protective cover in place until moment of installation. Valve performance depends upon prevention of damage to ball surface. Upon removal of cover, make sure that the valve is completely open and free of obstruction.

When shipped, valves contain a silicon based lubricant which aids the assembly of the valve; this may be removed with a solvent if found objectionable, alternatively, valves can be ordered pre of lubricants.

Certain ferrous valves are phosphate and oil dipped during the course of manufacture, but the processes used are completely non-toxic and the valves are quite safe to use for edible or potable products.

#### **Safety precautions**

Read this Installation, Operation and Maintenance Manual before using the valve.

Sharpe Valves cannot anticipate all the situations a user may encounter while installing and using the Sharpe Valve. The user must know and follow all applicable industry specifications on the safe installation and use of these valves. Only qualified personnel or technicians who are trained for maintenance work and have read the instructions are to assemble and disassemble the valve. Misapplication of the product may result in injuries or property damage.

Before removing valve from pipeline: media flowing through a valve may be corrosive, toxic, flammable, or of a contaminant nature. Where there is evidence of harmful fluids having flowed through the valve, the utmost care must be taken. It is suggested that the following safety precautions should be taken when handling valves:

- Always wear eye shields
- Always wear gloves and overalls
- Wear protective footwear
- Wear protective headgear
- Ensure that running water is easily available
- Have suitable fire extinguisher ready if media is flammable

By checking line gauges, ensure that no pressure exits on either the upstream or the downstream sides of the valve.

Ensure that any media is released by operating valve slowly to half-open position.

Ideally, the valve should be decontaminated when the ball is in the half-open position.

Leave valve is fully open position.

These valves, when installed, have body connectors which form an integral part of the pipeline, and the valve cannot be removed from the pipeline without being dismantled.

## **OPERATION**

Sharpe® valves provide tight shut off when used under normal conditions and in accordance with Sharpe® valves published pressure/temperature chart.

If these valves are used in a partially open (throttled) position, seat life may be reduced.

Any media which might solidify, crystallize or polymerize should not be allowed to stand in the ball valve cavities unless regular maintenance is provided. If minimal maintenance is performed, Sharpe® valves offer Cavity Filled and/or steam jacketed ball valves.

### **Manual Operation**

Sharpe® valves have ¼ turn operation closing in a counter-clockwise direction.

It is possible to see when the valve is open or closed by the position of the wrench handle:

- When the wrench is perpendicular to the pipeline the valve is closed.
- When the wrench is parallel to the pipeline the valve is open.

### **Remote operation**

Where manual operation is not required, valves may be automated for remote operation, instrument control, etc. A range of Sharpe® valves pneumatic and electric actuators are available.

Operation will be in accordance with Sharpe® valves installation, operation and maintenance instructions for relevant actuator.

Valves with Actuators should be checked for alignment of the actuator to the valve. Angular or parallel misalignment may result in high operational torque and potential damage to the stem seals or stem.

## **MAINTENANCE**

Sharpe® ball valves have been designed and engineered to provide long lasting and trouble-free service when used in accordance with the instructions and specifications herein.

Before installing the valves, the pipes must be flushed clean of dirt, burrs and welding residues, or you will damage the seats and ball surface.

These valves may be installed in any position using good pipe fitting practices.

### **General**

With self-wipe ball/seats and pressure equalizing slots, Sharpe® valves have a long, trouble-free life, and maintenance is seldom required. When necessary, valves may be refurbished, using a small number of components, none of which require machining. Sharpe® valves are designed for easy service and assembly in the field.

The following checks should, however, help to extend valve life or reduce plant problems.

### **Stem leakage in valves**

Stem seal leakage may be corrected without disassembly. If leakage is evident in stem packing area, tighten the adjusting nut 1/6 turn. If leakage persists, repeat above. Replacement of stem seals is indicated if the leak is still apparent after 1/2 turn.

Examine the disk springs for damage. If damaged, dismantle the stem down to the gland, fit new disk springs with their outer edges touching. Further maintenance necessitates dismantling of the valve.

**Leakage at body joint**

Check for tightness in the end plug. If loose, tighten with a proper tool.

If there is still leakage, this will be due to damage to body seal, and it will be necessary to dismantle the valve.

**In-Line Leakage**

Check that the valve is fully closed. If it is, leakage will be due to damaged seat or ball sealing surfaces, and it will be necessary to dismantle the valve.

Note: stem leakage and leakage at body joint, if not cured by simple means described above, necessitate dismantling valve. If there is not stem leakage, the stem assembly should not be touched.

**Leakage at Pipeline Joint**

Check that the flanged joints are aligned to the valve and assure there is compressive force on the gasket. Excessive force on the gasket may also cause leakage.

**REFURBISHING**

Before disassembly of valves from the pipeline follow these instructions:

1. Cycle the valve with the line pressure fully relieved before attempting to remove the valve from the pipeline to insure pressure has also been discharged from the valve cavity.
2. Remove flange bolts and nuts (if it's a wafer style) and lift valve from line. Care should be taken to avoid scratching or damaging flange facings.
3. Remove end plug, using proper tool.
4. Remove and discard of the seat ring and body seal. Be careful not to damage the sealing surfaces when you remove these items.
5. To take out the ball, rotate stem so ball is in fully closed position. Carefully lift ball off stem tang and from body with a "rolling" motion. Use a strap and lift device, if necessary. Note: Extreme caution should be taken to avoid damage to the ball.
6. To dismantle the stem assembly, first remove the handle nut and handle from stem. Using a wrench to prevent the stem from turning, remove the packing nut, disk springs and gland. It is normally not possible to remove gland packing at this stage.
7. Withdraw the stem through the body cavity and remove the thrust seals from the stem. Gland packing may now be removed from the top of the stem bore.
8. Take out the other seat.
9. Clean all components thoroughly and examine all seating/sealing surfaces.
10. If there is build-up of solids which cleaning fluids will not remove, use a board, flat or blunt tool (do not scratch the machined surfaces).
11. No eroded or corroded leak paths are permissible. If any are found, the part must be replaced. The ball must have no scratches across its seating surfaces and any damage to the port lip will destroy the new seats – a damaged ball must not be reused, install a new ball.

**Rebuilding**

Note: The valve may be assembled and operated dry where no lubricants are allowed in the system; however, a light lubrication of mating parts will aid in assembly and reduce initial

operating torque. Lubricant used must be compatible with the intended line fluid. Before rebuilding, check that all the correct components are available and that they are fit for re-assembling. When rebuilding, cleanliness is essential to allow long valve life and provide cost-effective maintenance.

1. Install one seat in the body cavity with the spherical curvature facing the ball.
2. Lubricate the new stem thrust seals and packing, with appropriate lubricant.
3. Fit the stem thrust bearing to the stem and insert them through body cavity into stem hole and push it up into body recess. Fit together the bottom, middle and top stem packing to make it easier to assemble. Fit gland packing, gland and disk springs. Put the first spring concave side down and the second spring concave side up. Repeat that with the other two springs
4. Using wrench to prevent stem from turning, fit the nut and tighten to the torque figures below:

**STEM NUT TIGHTENING TORQUE**

VALVE SIZE	THREAD	TORQUE (NM)	TORQUE (LBS.IN)
2"	9/16" - 18UNEF	30	265
3" - 4"	1" - 14UNC	60	530

5. Place the lock tab on the gland nut and adjust the orientation of the nut (loosen the nut if you needed).
6. Operate stem several times and readjust. Overnighting will only reduce the Life of the stem assembly. Now fit handle nut to stem assembly and move stem into closed position - handle perpendicular to the pipeline.
7. Smear an anti-seize lubricant to the thread of the body and end cap.
8. Thread the end plug into the body all the way until it reaches its final position. Use a marker and mark a radial line going from the center across the end plug and to the body which will serve as an indication to its position once assembled. Remove the end cap (see figure 1).
9. With the stem still in the closed position, the ball may be inserted into the body cavity by sliding the ball slot over the stem tang. Open the valve.
10. Note: With the valve in the open position, the ball is retained by the stem tang and cannot fall out of the body cavity.
11. Fit the remaining seat ring to the body end.
12. Fit the body seal into the body.
13. Note: a trace of silicon based lubricant or clean grease (such as petroleum Jelly), if compatible with the future pipeline media, will ease the rebuilding by holding the seat rings and body connector seals in place. Use no grease with abrasive additives.
14. Thread the end plug into the body and tighten with proper tool until you align the marked line of the end plug and body. This makes sure the end cap is fitted all the way.
15. Cycle the valve open and closed several times slowly to ensure that operation is smooth and free of binding or sticking.

### Maintenance kits

Maintenance kits are available from Sharpe® valves. These kits consist of the following parts:

1. 2 seat rings.
2. 1 body seal.
3. 1 stem thrust seal.
4. 1 or 2 stem packing (depending on the material).

When ordering maintenance kits, please be sure to specify type and size of valve and seating material required.

Where a valve needs repairing, rather than maintaining, it must be noted that only Sharpe® valves authorized spare parts should be used. In addition to maintenance kits, spare parts available from Sharpe® valves are balls, stems, glands and Belleville springs. If additional parts are required, it is normally recommended that the complete valve be replaced.

Parts from different valve series should not be interchanged.

This is to ensure, so far as is reasonably practicable, that the valve remains capable of being used for the purpose for which it was designed and constructed, without risk to health and safety of plant personnel.

### TESTING & INSTALLATION

The valve must be properly secured during testing. The mating flanges should be the same rating as the valves. Secure the valve to the test fixture by means of a mating flange with full bolting and a suitable gasket. Orient the valve so the seat to be tested is facing up.

Apply 50 to 100 psig air into the end of the closed valve which is attached to the fixture.

Pour water into the upper port to cover the ball and visually check for bubbles. If bubbles are coming out, cycle the valve several times and recheck. To check for leakage in the other port, reverse the valve and repeat the process.

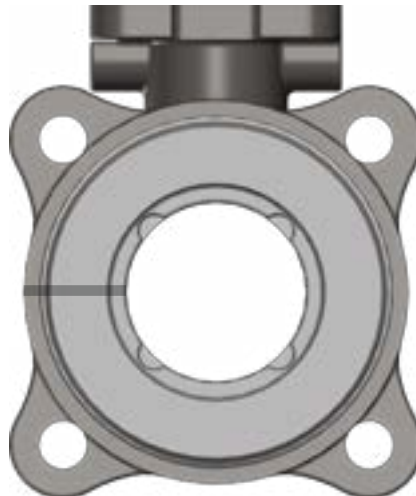
In the event of stem seal leakage, adjust as described under paragraph, “Stem leakage in valves”.

Installing the valve into the pipe line is done with thru bolts and nuts for wafer style valves and with threaded bolts to the body with lug style valves.

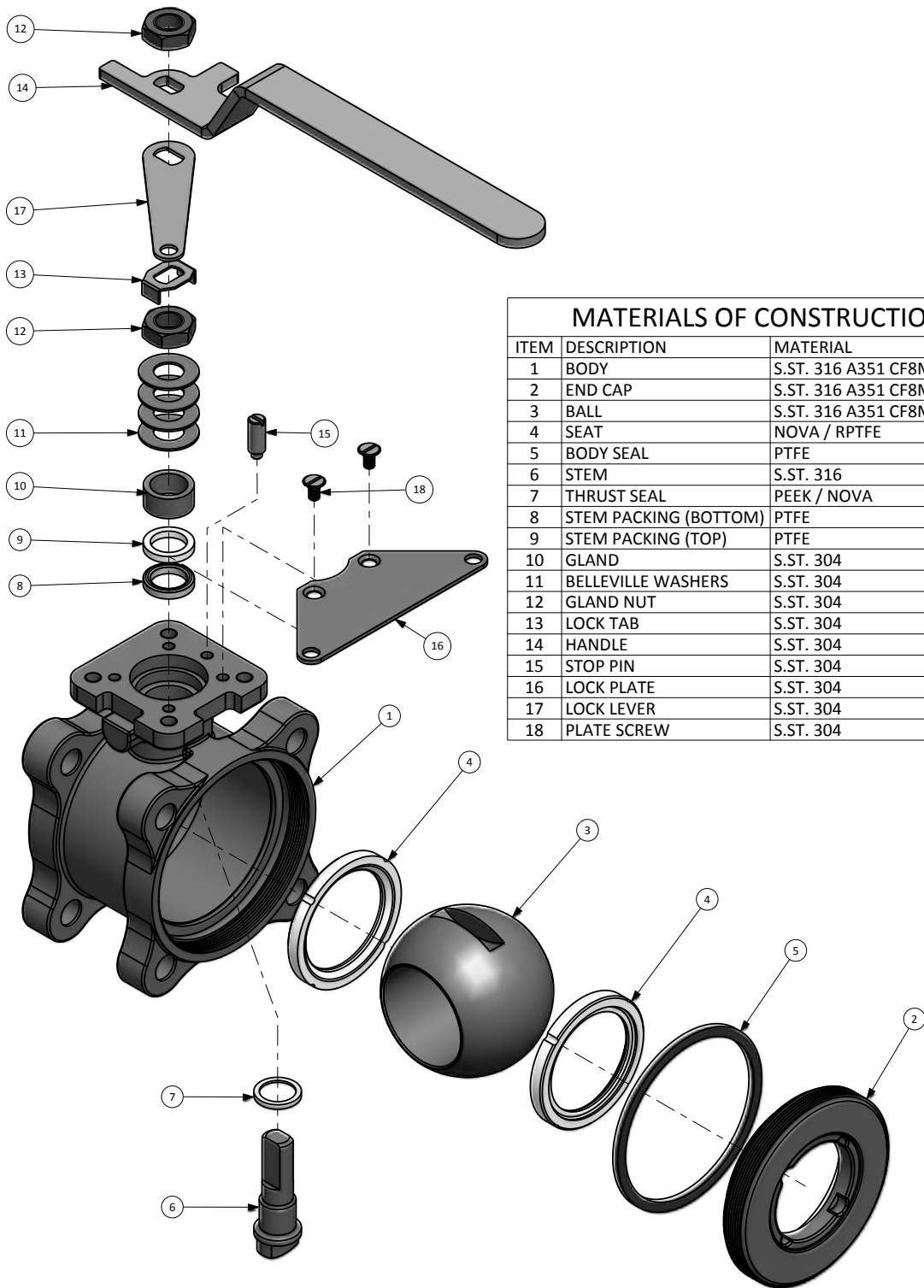
Follow the instruction under “Leakage at Pipeline Joint”.

#### Figure 1

Mark a radial line going from the center across the end plug and to the body

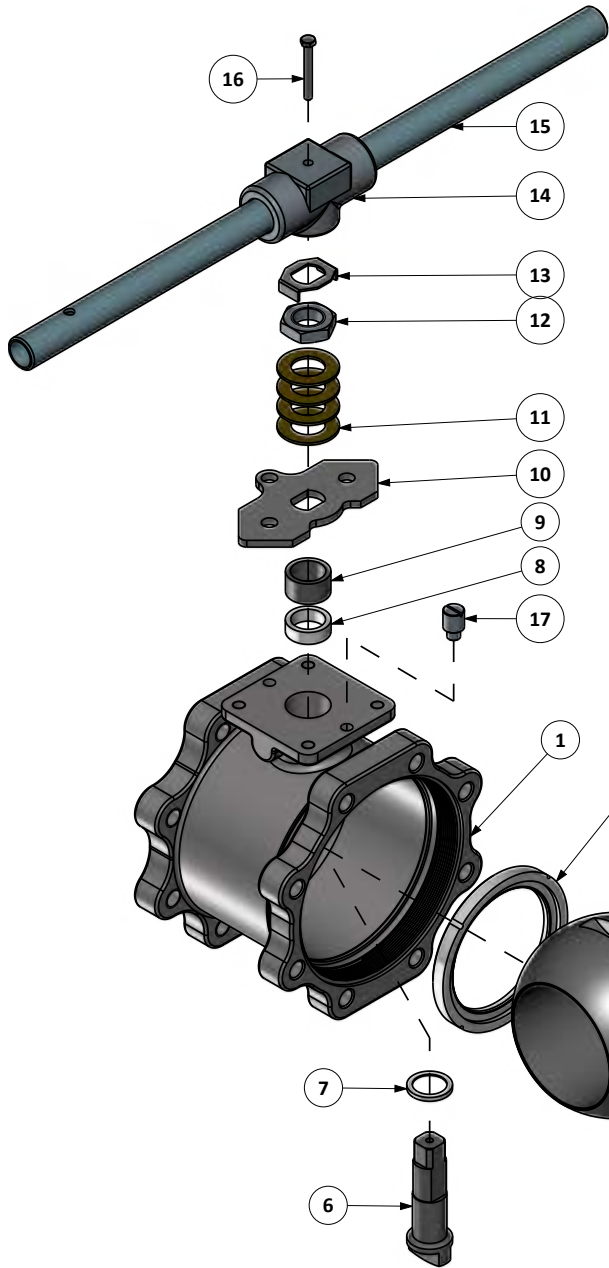






### MATERIALS OF CONSTRUCTION

ITEM	DESCRIPTION	MATERIAL	QTY.
1	BODY	S.ST. 316 A351 CF8M	1
2	END CAP	S.ST. 316 A351 CF8M	1
3	BALL	S.ST. 316 A351 CF8M	1
4	SEAT	NOVA / RPTFE	2
5	BODY SEAL	PTFE	1
6	STEM	S.ST. 316	1
7	THRUST SEAL	PEEK / NOVA	1
8	STEM PACKING (BOTTOM)	PTFE	1
9	STEM PACKING (TOP)	PTFE	1
10	GLAND	S.ST. 304	1
11	BELLEVILLE WASHERS	S.ST. 304	4
12	GLAND NUT	S.ST. 304	2
13	LOCK TAB	S.ST. 304	1
14	HANDLE	S.ST. 304	1
15	STOP PIN	S.ST. 304	1
16	LOCK PLATE	S.ST. 304	1
17	LOCK LEVER	S.ST. 304	1
18	PLATE SCREW	S.ST. 304	2



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5	BODY SEAL	PTFE	1
6	STEM	S.ST. 316	1
7	THRUST SEAL	PEEK / NOVA	1
8	STEM PACKING	PTFE	1
9	GLAND	S.ST. 304	1
10	STOP PLATE	S.ST. 304	1
11	BELLEVILLE WASHERS	S.ST. 304	4
12	GLAND NUT	S.ST. 304	2
13	LOCK TAB	S.ST. 304	1
14	WRENCH BLOCK	A351 CF8M	1
15	PIPE WRENCH	GALVANIZED STEEL	1
16	HANDLE BOLT	S.ST. 304	1
17	STOP PIN	S.ST. 304	1